

## NIKUNI Liquid Ring Vacuum Pump

Outstanding and Excellent Performances



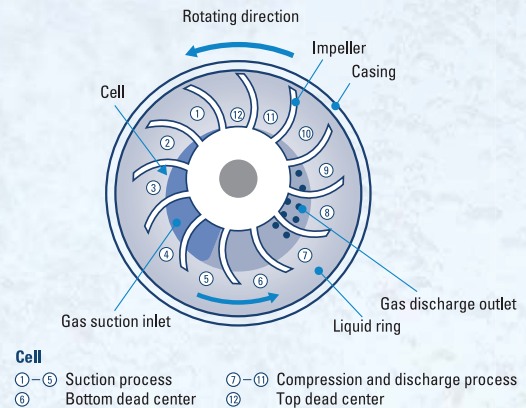
# Eliminate trouble caused by drawing mist and steam

Prevents environment pollution due to the contamination of oil into water or generation of oil-mist

## Liquid Ring Vacuum Pump operating principle

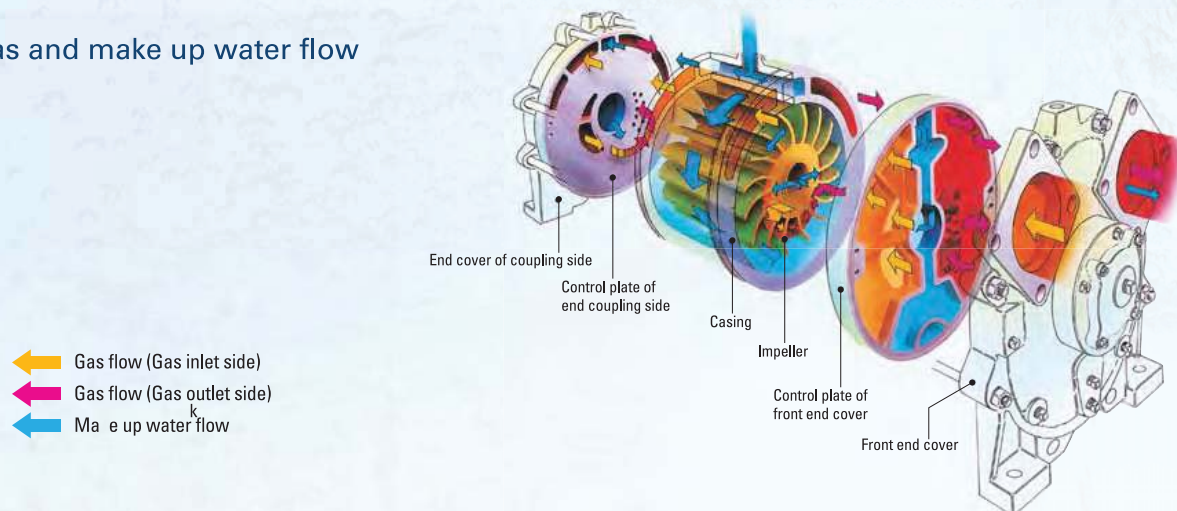
### Construction and operating principle

Liquid ring vacuum pump is the single stage vacuum pump of the single action and side gas suction inlet. It is composed of main components such as the cylindrical casing, sets of a cover and port plate are provided for both front and rear end, the impeller shaft eccentrically arranged relative to the casing, bearings and the shaft seal. As shown in the picture on the right, the water in the casing is pushed out circumferentially as the impeller turns to form the liquid ring which in turn creates the crest shaped space at its center. This space is divided into a number of cells by impeller blades. Those segments repeat compression and expansion as the impeller turns. By providing gas inlets and outlets at proper locations on port plates, the machine works as the vacuum pump or the compressor where the gas is continuously sucked, compressed and discharged.



Liquid ring pump single action type (Side inlet type)

### Gas and make up water flow



## Features

### 1 Safety

The Liquid Ring Vacuum pumps are capable handling gases containing mist and steam without troubles as the gas is sucked and compressed in each cells of the impeller by the actions of water piston movements. There is no metal-to-metal contact for internal parts and the pump is free from the gas leakage because it is sealed by the liquid film. Therefore, the pump is suitable for sucking and compressing explosive, flammable and corrosive gases.

### 2 Economy

Outstanding power consumption saving is realized thanks to the high efficiency fundamental design to strive for economy (reduction of power consumption by 30% compared with the double action type). The liquid ring construction assures the leak free operation and effective compression, appropriately for valuable gases transferring applications.

### 3 Low noise operation

Continuous suction and compression processes by the impeller revolution, suppresses pulsation and vibration resulting low noise operation. The noise can be further suppressed to the extraordinary level by the combination with silencer separator.

### 4 Durability

In addition to the simple and robust construction, the pump has excellent durability due to no wearing or mechanical contacts of internal parts except for the shaft seal portion.

The side gas intake construction (gas inlet and outlet in the pump are vertically aligned to the shaft) makes the pump less susceptible of wearing, enabling the pump to maintain the high efficiency over long period of time compared with the internal gas inlet type (NASH system)

### 5 Cleanness

Clean environment can be maintained as it is free from the oil mist, comparing with the unlike oil sealed rotary vacuum pump.

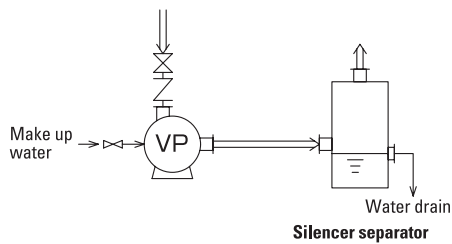
# Application and Flow chart

## Applications

- General industry (Vacuum filtration, Pressure dehydration)
- Semi-conductor industry (Pure water degasing, Vacuum chucking)
- Vacuum chemical industry (Concentration, Distillation, Drying, Reaction)
- Vacuum exhaust equipment (Vacuum impregnation, Vacuum molding, Water priming)
- Vacuum conveyer (Vacuum chucking, Conveyer, Fixing)
- Medical application (Sterilization, Medical waste vacuuming)
- Paper and pulp industry (Paper machine – Dehydration, Degasing, Drying)
- Agriculture community waste water treatment collection
- Other application (Land subsidence acceleration, Vacuum filling, Vacuum cleaning, Vacuum casting)

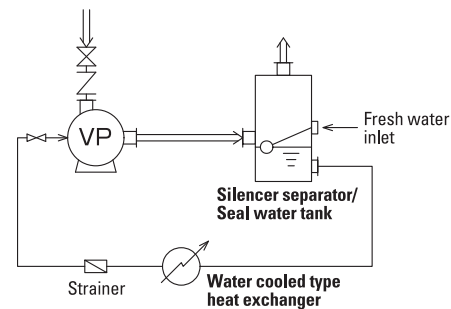


## Flow chart



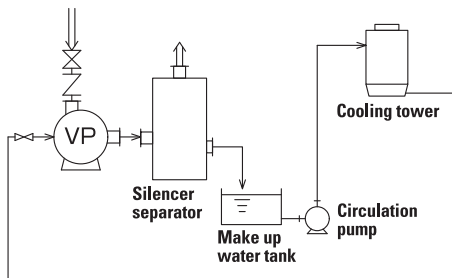
### Make up water one-pass system

Most common arrangement. Make up water is discharged right away after going through the pump.



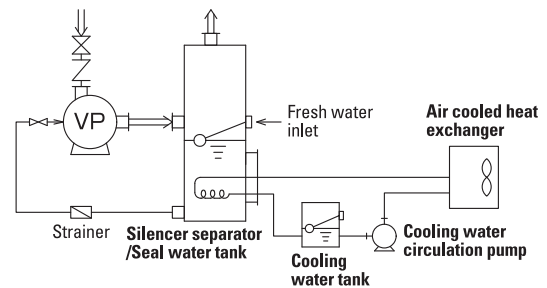
### Make up water circulation system: Type 1

Make up water is cooled with the heat exchanger installed in the circulation line and circulated.



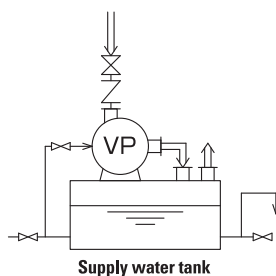
### Supply water circulation system: Type 2

Make up water is cooled by the cooling tower and circulated.



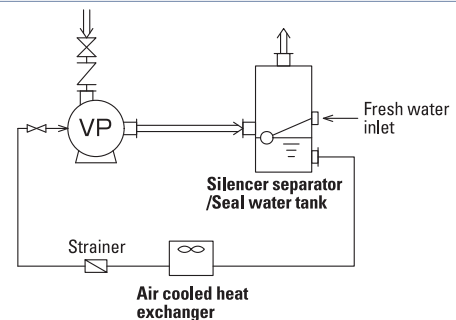
### Supply water circulation system: Type 3

Make up water is cooled with the heat exchanger installed in the circulation line and circulated.



### Supply water circulation system: Type 4

Pump is installed above the make up water tank to circulate the make up water. Care shall be taken for the temperature rise of the make up water.



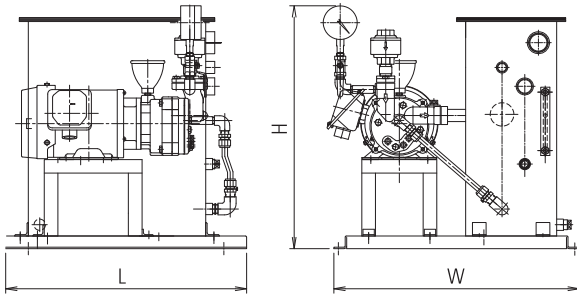
### Supply water circulation system: Type 5

Make up water is cooled with the heat exchanger installed in the circulation line and circulated.

**NIKUNI also offers unified vacuum systems – UNIVAS, completed with vacuum pump, seal water tank, silencer separator. Enable to miniaturize overall system sizes, save installation foot print and replaceable of existing vacuum systems.**

## Model & Specification

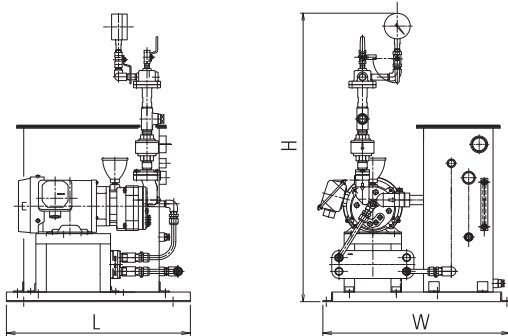
### Standard model



No.	Parts name	Qt'y	Material		Remarks
			UNIVAS-S	UNIVAS-F	
1	Liquid ring vacuum pump	1	SCS13	FC200/SCS13	TEFC outdoor proof motor
2	Make up water tank & Silencer separator	1	SUS304 or FRP		Prefer material selectable
3	Ball tap	1	SUS304	CAC/PE	
4	Level gauge	1	Acrylic		
5	Vacuum pressure gauge	1	SUS316	C3604	-0.1~0 MPa ø75
6	Liquid sealed check valve	1	SCS13 / FKM		

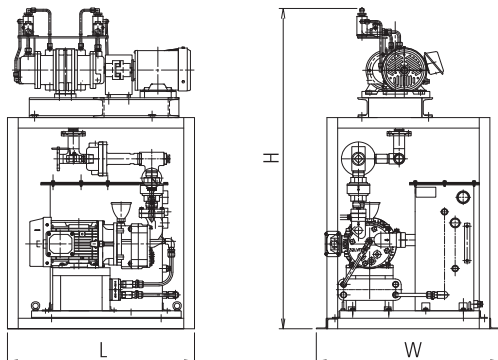
Model	Shaft power	Suction port diameter	Discharge port diameter	L	W	H
UNIVAS-04Z	0.4kW	Rc3/4	Rc1 · 1/4	530	540	540
UNIVAS-07Z	0.75kW	Rc3/4	Rc1 · 1/4	530	540	540
UNIVAS-15Z	1.5kW	Rc1	Rc1 · 1/4	600	600	560
UNIVAS-22Z	2.2kW	Rc1 · 1/4	Rc1 · 1/4	600	600	570
UNIVAS-37Z	3.7kW	40A (JIS5K)	50A (JIS10K)	715	660	825
UNIVAS-55Z	5.5kW	50A (JIS5K)	50A (JIS10K)	1000	835	905

### Equipped with Gas Ejector model



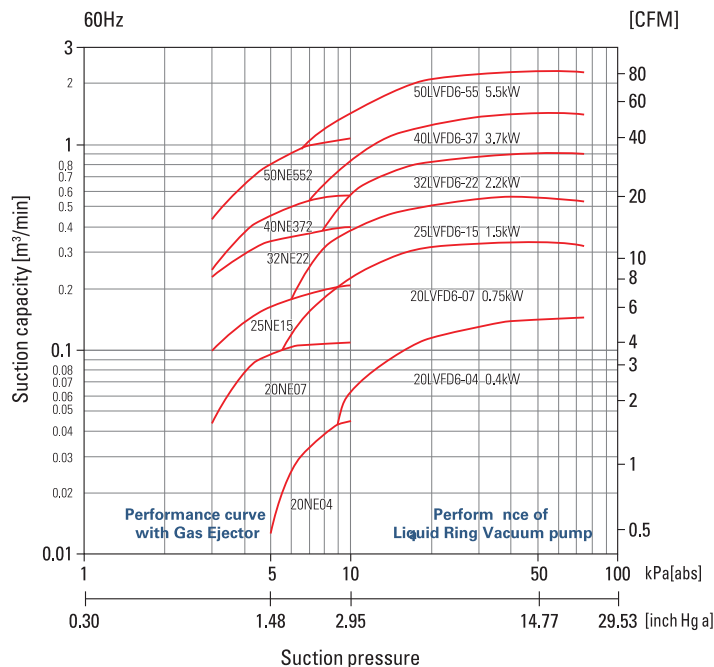
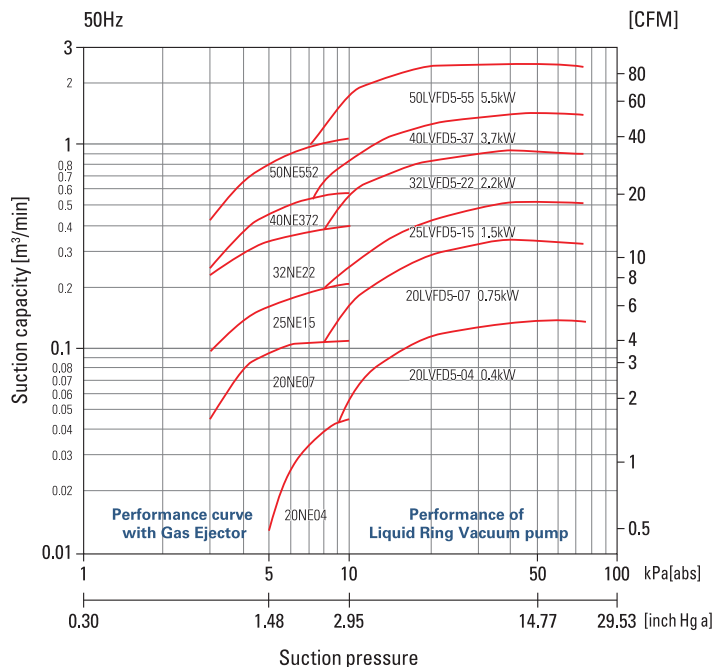
Model	Shaft power	Suction port diameter	Discharge port diameter	L	W	H
UNIVAS-04Z-EH	0.4kW	Rc3/4	Rc1 · 1/4	530	540	840
UNIVAS-07Z-EH	0.75kW	Rc3/4	Rc1 · 1/4	530	540	840
UNIVAS-15Z-EH	1.5kW	Rc1	Rc1 · 1/4	600	600	950
UNIVAS-22Z-EH	2.2kW	Rc1 · 1/4	Rc1 · 1/4	600	600	1000
UNIVAS-37Z-EH	3.7kW	32A (JIS10K)	50A (JIS10K)	715	660	1210
UNIVAS-55Z-EH	5.5kW	32A (JIS10K)	50A (JIS10K)	1000	835	1480

### Equipped with Gas Ejector & Mechanical Booster model

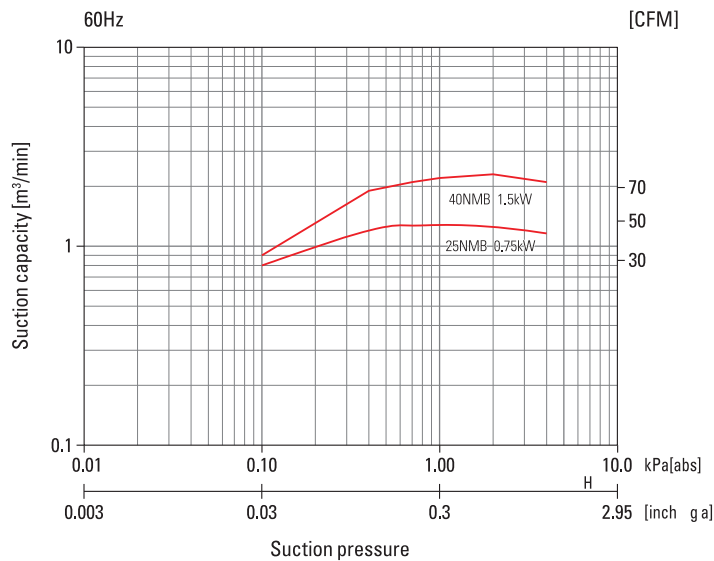
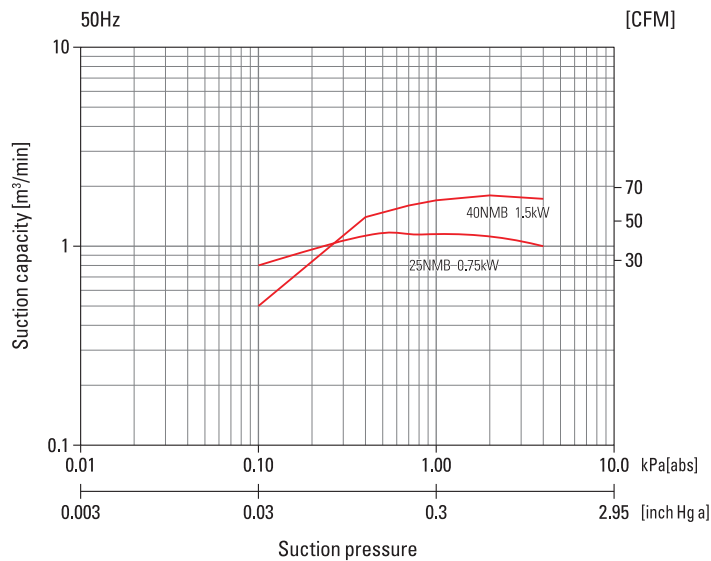


Model	Shaft power	Suction port diameter	Discharge port diameter	L	W	H
UNIVAS-22Z-BH	2.2kW/0.75kW	25A (VG25A)	Rc1 · 1/4	700	690	1250
UNIVAS-37Z-BH	3.7kW/1.5kW	40A (VG40A)	50A (JIS10K)	800	830	1650

### Performance curve of Liquid Ring Vacuum Pump & Gas Ejector



### Performance curve of Mechanical Booster



Model	Mechanical booster model	Shaft power of mechanical booster	Frequency	Suction capacity m³/min · Suction pressure kPa[abs]						Model number of backward vacuum pump
				0.1	0.4	0.7	1	2	4	
UNIVAS-522-B	25NMB	0.75kW	50Hz	0.8	1.13	1.15	1.15	1.12	1.0	32LVSD5-22ZE+32NE22
UNIVAS-622-B			60Hz	0.8	1.2	1.27	1.28	1.25	1.16	32LVSD6-22ZE+32NE22
UNIVAS-537-B	40NMB	1.5kW	50Hz	0.5	1.4	1.6	1.7	1.8	1.73	40LVSD5-37ZE+40NE37
UNIVAS-637-B			60Hz	0.9	1.9	2.1	2.2	2.3	2.1	40LVSD6-37ZE+40NE37

### Bare Vacuum Pump performance table (50Hz)

Model	Bore diameter mm	Rotating speed D: Direct driven V: Belt driven min <sup>-1</sup>	Shaft power kW × P	Suction condition sucking volume m <sup>3</sup> /min · Suction pressure kPa[abs]							Make up water	
				8	10	15	20	35	54	100	Approx. water volume L/min	Required pressure MPa (gauge)
				8	10	15	20	35	54	100	L/min	MPa (gauge)
LV202	200	675V	110 × 4	47	50.6	56.7	59.6	63.7	64.5	64	170	0.15
		590V,D	90 × 4, 10	42.5	45.4	49.5	52	55.9	56.7	56	170	
		540V	75 × 4	36.1	38.2	41.8	44.3	48.5	50	49	140	
LV102	150	880V	75 × 4	33.5	35.2	38.4	40	42	43	42	120	
		735V,D	55 × 4, 8	29.3	30.5	32.5	33.5	34.8	35.5	35	100	
		645V	45 × 4	22.1	24.3	26.4	27.5	29.5	31.2	31	90	
SKH882	150	970V,D	45 × 4, 6	14.9	17.9	21.8	23.8	25.8	26	24	80	
		880V	37 × 4	13.7	15.7	19.6	21.3	22.7	23.3	22.5	70	
		735V,D	30 × 4, 8	10.9	13.1	16.7	18.5	19.6	19.8	17.5	60	
SKH782	125	1130V	30 × 4	11.8	13.6	16	17	17.5	17.5	17	70	
		970D	22 × 6	10.4	11.8	13.6	14.2	15	14.7	14.1	60	
SKH762	100	970D	18.5 × 6	8.5	9.6	11.2	12	12.5	12.5	12.1	55	
SKH742	100	970D	15 × 6	6.4	7.4	9	9.7	10	10	9.8	50	
SKH562	80	1450D	11 × 4	4	4.7	5.9	6.4	7	7	6.8	40	
SKH542	65	1450D	7.5 × 4	2.8	3.3	4.1	4.4	4.7	4.7	4.5	35	
SKH462	65	1450D	5.5 × 4	2	2.5	3.1	3.4	3.7	3.75	3.7	30	
50LVFD5-55	50	1450	5.5 × 4	1.6	1.89	2.28	2.41	2.55	2.64	-	20	0.05
40LVFD5-37	40	2900	3.7 × 2	0.66	0.87	1.14	1.28	1.43	1.4	-	12	
32LVFD5-22	32	2900	2.2 × 2	0.4	0.58	0.76	0.84	0.92	0.91	-	7	
25LVFD5-15	25	2900	1.5 × 2	0.195	0.26	0.37	0.43	0.51	0.52	-	5	
20LVFD5-07	20	2900	0.75 × 2	0.11	0.17	0.245	0.29	0.33	0.31	-	3	
20LVFD5-04	20	2900	0.4 × 2	0.026	0.062	0.098	0.115	0.138	0.145	-	2	

\*Performances of the vacuum pump represented are when the make up water temperature is 15°C.

\*LVFD and LVSD are self-priming types for the make up water.

\*LVSD is the stainless steel model of LVFD.

\*LVFD and LVSD are closed-couple model.

### Gas Ejector performance table (50Hz)

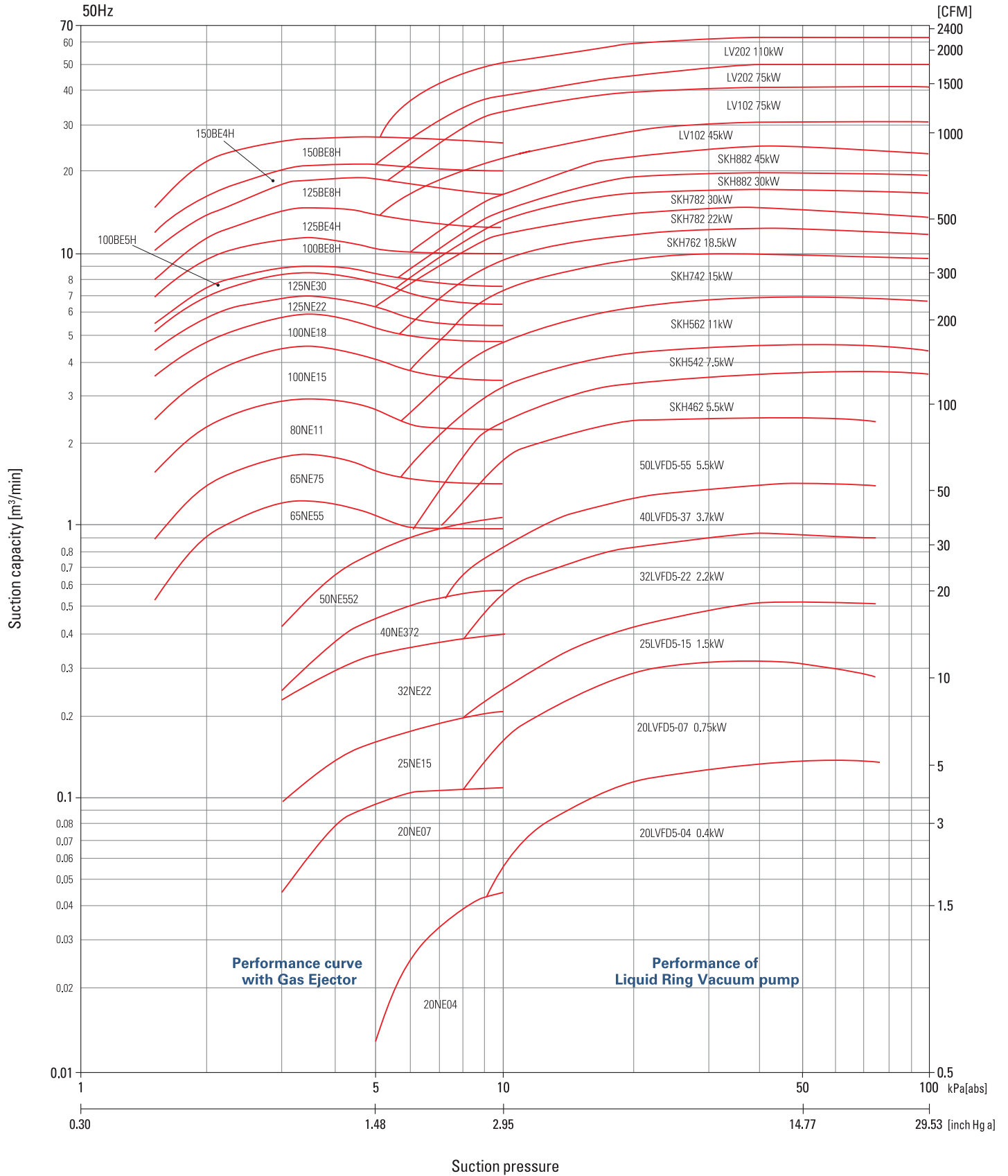
Bore diameter · Model number		Max. negative pressure kPa[abs]	Suction condition sucking volume m <sup>3</sup> /min · Suction pressure kPa[abs]							Model number of backward vacuum pump		
SS	SUS		1.5	2	2.5	3	4	5	Bore diameter · Model	Rotating speed min <sup>-1</sup>	Shaft power kW	
150BE8H	150BE8HT	0.7	16	22.5	26.5	28.5	28.5	28.7	200LV202	675	110	
150BE6H	150BE6HT	0.7	14	20	23.5	25.5	25.5	24.5	200LV202	590	90	
150BE4H	150BE4HT	0.7	12.5	17.5	20.5	22	22	21.5	200LV202	540	75	
125BE8H	125BE8HT	0.7	11	15.5	18.5	19.5	19.8	19.2	150LV102	880	75	
125BE6H	125BE6HT	0.7	9.5	13.5	15.8	17	17	16.5	150LV102	735	55	
125BE4H	125BE4HT	0.7	8	11.5	13.5	14.2	14.5	13.8	150LV102	645	45	
100BE8H	100BE8HT	0.7	7	9.8	11.7	12.5	12.5	12.2	150SKH882	970	45	
100BE6H	100BE6HT	0.7	6.3	9	10.7	11.5	11.5	11	150SKH882	880	37	
100BE5H	100BE5HT	0.7	5.2	7.2	8.7	9.3	9.3	9	150SKH882	735	30	
125NE30	100BE4HT	0.7	5.2	7	8	8.4	8.4	7.8	125SKH782	1130	30	
125NE22	80BE6HT	0.8	4.5	5.8	6.6	6.9	6.8	6.4	125SKH782	970	22	
100NE18	65BE8HT	0.8	3.6	4.8	5.6	5.8	5.8	5.3	100SKH762	970	18.5	
100NE15	65BE6HT	0.9	2.5	3.6	4.2	4.5	4.5	4.1	100SKH742	970	15	
80NE11	50BE6HT	0.9	1.6	2.35	2.75	2.9	2.9	2.7	80SKH562	1450	11	
65NE75	40BE6HT	1.1	0.9	1.42	1.68	1.8	1.8	1.6	65SKH542	1450	7.5	
65NE55	32BE8HT-65T	1.2	0.54	0.92	1.1	1.22	1.2	1.1	65SKH462	1450	5.5	

Bore diameter · Model number		Max. negative pressure kPa[abs]	Suction condition sucking volume m <sup>3</sup> /min · Suction pressure kPa[abs]							Model number of backward vacuum pump		
SS	SUS		3	4	5	6	8	10	Bore diameter · Model	Rotating speed min <sup>-1</sup>	Shaft power kW	
50NE552	50NES552	1.7	0.43	0.67	0.81	0.92	1.03	1.09	50LVFD5-55	2900	1450	5.5
40NE372	40NES372	1.7	0.25	0.38	0.46	0.51	0.57	0.58	40LVFD5-37		3.7	
32NE22	32NES22	1.7	0.232	0.3	0.34	0.36	0.39	0.4	32LVFD5-22		2.2	
25NE15	25NES15	1.7	0.098	0.14	0.165	0.18	0.2	0.21	25LVFD5-15		1.5	
20NE07	20NES07	2.4	0.045	0.08	0.096	0.105	0.108	0.125	20LVFD5-07		0.75	
20NE04	20NES04	4.7	-	-	0.013	0.026	0.04	0.046	20LVFD5-04		0.4	

\*Performance of the gas ejector represented are when the make up water temperature below 30°C.

\*Please consult to our engineer for the performances of the gas ejector when the make up water temperature below 15°C.

**Performance curve of Liquid Ring Vacuum Pump & Gas Ejector**



## Bare Vacuum Pump performance table (60Hz)

Model	Bore diameter mm	Rotating speed D: Direct driven V: Belt driven min <sup>-1</sup>	Shaft power kW × P	Suction condition sucking volume m <sup>3</sup> /min · Suction pressure kPa[abs]							Make up water	
				8	10	15	20	35	54	100	Approx. water volume L/min	Required pressure MPa (gauge)
				8	10	15	20	35	54	100		
LV202	200	675V	110 × 4	47	50.6	56.7	59.6	63.7	64.5	64	170	0.15
		590V	90 × 4	42.5	45.4	49.5	52	55.9	56.7	56	170	
		540V	75 × 4	36.1	38.2	41.8	44.3	48.5	50	49	140	
LV102	150	880V,D	75 × 4, 8	33.5	35.2	38.4	40	42	43	42	120	
		735V	55 × 4	29.3	30.5	32.5	33.5	34.8	35.5	35	100	
		645V	45 × 4	22.1	24.3	26.4	27.5	29.5	31.2	31	90	
SKH882	150	970V	45 × 4	14.9	17.9	21.8	23.8	25.8	26	24	80	
		880V,D	37 × 4, 8	13.7	15.7	19.6	21.3	22.7	23.3	22.5	70	
		735V	30 × 4	10.9	13.1	16.7	18.5	19.6	19.8	17.5	60	
SKH782	125	1160D	30 × 6	12	13.9	16.2	17.2	18	18	17.5	70	
		940V	22 × 4	10	11.2	13.1	14	14.5	14.5	14	60	
SKH682	100	1160D	18.5 × 6	8.3	9.5	11	11.8	12.2	12.2	11.9	50	
SKH662	100	1160D	15 × 6	6.5	7.6	9	9.6	10	10	9.7	45	
SKH562	80	1750D	15 × 4	4.6	5.6	6.9	7.5	8.2	8.2	8	45	
SKH642	80	1160D	11 × 6	4.3	5	6.1	6.6	7	7	6.8	40	
SKH542	65	1750D	11 × 4	3.2	3.85	4.75	5.08	5.4	5.5	5.3	40	
SKH462	65	1750D	7.5 × 4	2.6	3.15	3.9	4.2	4.6	4.65	4.5	30	
SKH442	50	1750D	5.5 × 4	1.75	2.17	2.7	3	3.25	3.28	3.2	25	
SKH422	50	1750D	3.7 × 4	0.8	1.02	1.43	1.68	1.92	2	2.03	20	
50LVFD6-55	50	1750	5.5 × 4	1.6	1.89	2.28	2.41	2.55	2.64	-	20	
40LVFD6-37	40	3500	3.7 × 2	0.66	0.87	1.14	1.26	1.32	1.35	-	12	
32LVFD6-22	32	3500	2.2 × 2	0.4	0.59	0.77	0.84	0.91	0.91	-	6	
25LVFD6-15	25	3500	1.5 × 2	0.32	0.39	0.48	0.52	0.57	0.56	-	4	
20LVFD6-07	20	3500	0.75 × 2	0.185	0.23	0.282	0.299	0.326	0.326	-	3	
20LVD6-04	20	3500	0.4 × 2	0.026	0.062	0.098	0.115	0.138	0.145	-	2	

\*Performances of the vacuum pump represented are when the make up water temperature is 15C°.

\*LVFD and LVSD are self-priming types for the make up water.

\*LVSD is the stainless steel model of LVFD.

\*LVFD and LVSD are closed-couple model.

## Gas Ejector performance table (60Hz)

Bore diameter · Model number		Max. negative pressure kPa[abs]	Suction condition sucking volume m <sup>3</sup> /min · Suction pressure kPa[abs]							Model number of backward vacuum pump		
SS	SUS		1.5	2	2.5	3	4	5	Bore diameter · Model	Rotating speed min <sup>-1</sup>	Shaft power kW	
150BE8H	150BE8HT	0.7	16	22.5	26.5	28.5	28.5	28.7	200LV202	675	110	
150BE6H	150BE6HT	0.7	14	20	23.5	25.5	25.5	24.5	200LV202	590	90	
150BE4H	150BE4HT	0.7	12.5	17.5	20.5	22	22	21.5	200LV202	540	75	
125BE8H	125BE8HT	0.7	11	15.5	18.5	19.5	19.8	19.2	150LV102	880	75	
125BE6H	125BE6HT	0.7	9.5	13.5	15.8	17	17	16.5	150LV102	735	55	
125BE4H	125BE4HT	0.7	8	11.5	13.5	14.2	14.5	13.8	150LV102	645	45	
100BE8H	100BE8HT	0.7	7	9.8	11.7	12.5	12.5	12.2	150SKH882	970	45	
100BE6H	100BE6HT	0.7	6.3	9	10.7	11.5	11.5	11	150SKH882	880	37	
100BE5H	100BE5HT	0.7	5.2	7.2	8.7	9.3	9.3	9	150SKH882	735	30	
125NE30	100BE4HT	0.7	5.2	7	8	8.4	8.4	7.8	125SKH782	1160	30	
125NE22	80BE6HT	0.8	4.5	5.8	6.6	6.9	6.8	6.4	125SKH782	940	22	
100NE18	65BE8HT	0.8	3.6	4.8	5.6	5.8	5.8	5.3	100SKH682	1160	18.5	
100NE15	65BE6HT	0.9	2.5	3.6	4.2	4.5	4.5	4.1	100SKH662	1160	15	
80NE11	50BE6HT	0.9	1.6	2.35	2.75	2.9	2.9	2.7	80SKH642	1160	11	
65NE75	40BE6HT	1.1	0.9	1.42	1.68	1.8	1.8	1.6	65SKH462	1750	7.5	
65NE55	32BE8HT-65T	1.2	0.54	0.92	1.1	1.22	1.2	1.1	50SKH442	1750	5.5	
40NE37	32BE6LT	1.6	-	-	-	0.4	0.61	0.76	50SKH422	1750	3.7	

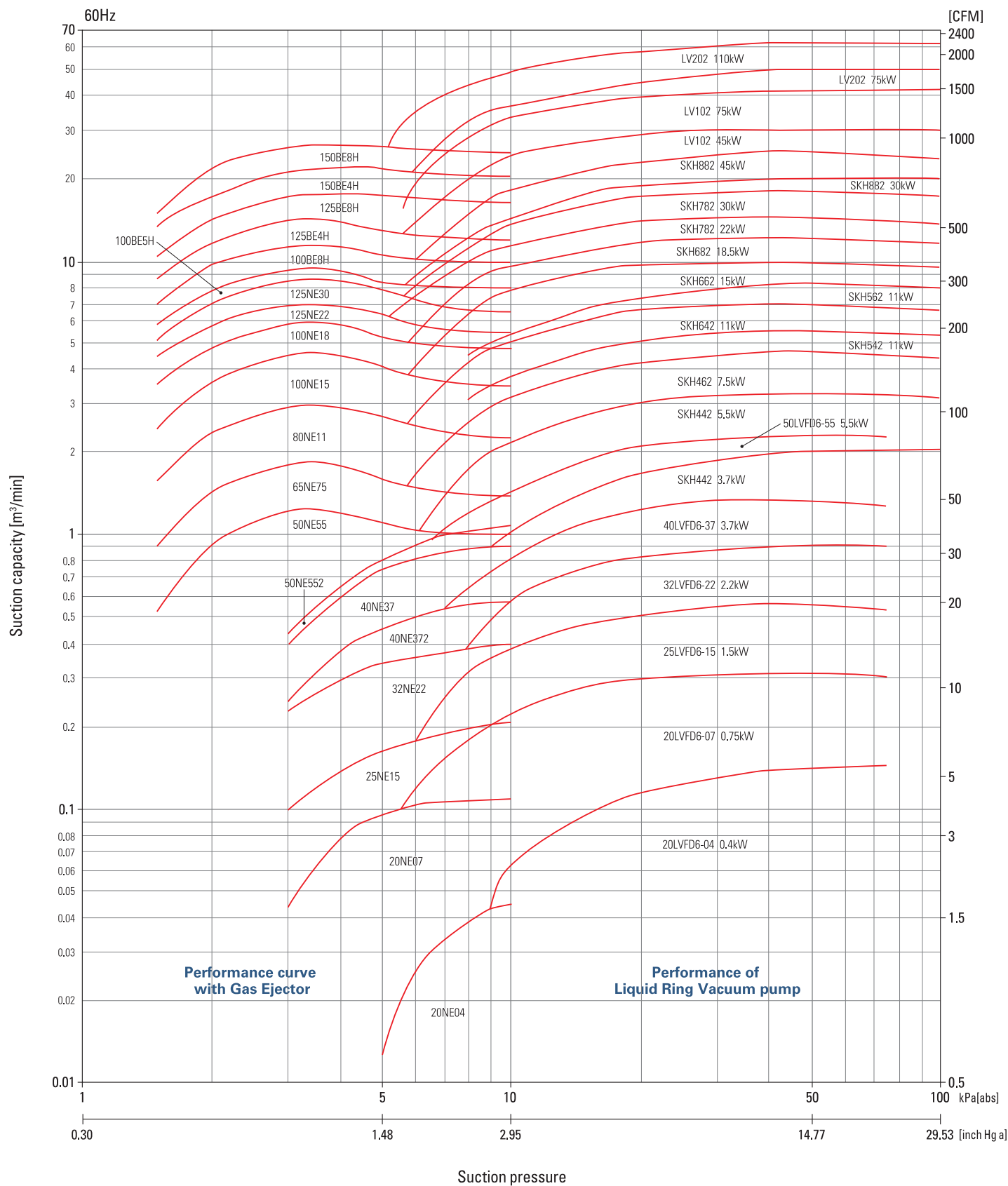
Bore diameter · Model number		Max. negative pressure kPa[abs]	Suction condition sucking volume m <sup>3</sup> /min · Suction pressure kPa[abs]							Model number of backward vacuum pump		
SS	SUS		3	4	5	6	8	10	Bore diameter · Model	Rotating speed min <sup>-1</sup>	Shaft power kW	
50NE552	50NES552	1.7	0.43	0.67	0.81	0.92	1.03	1.09	50LVFD6-55	3500	5.5	
40NE372	40NES372	1.7	0.25	0.38	0.46	0.51	0.57	0.58	40LVFD6-37		3.7	
32NE22	32NES22	1.7	0.232	0.3	0.34	0.36	0.39	0.4	32LVFD6-22		2.2	
25NE15	25NES15	1.7	0.098	0.14	0.165	0.18	0.2	0.21	25LVFD6-15		1.5	
20NE07	20NES07	2.4	0.045	0.08	0.096	0.105	0.108	0.125	20LVFD6-07		0.75	
20NE04	20NES04	4.7	-	-	0.013	0.026	0.04	0.046	20LVFD6-04		0.4	

\*Performance of the gas ejector represented are when the make up water temperature below 30C°.

\*Please consult to our engineer for the performances of the gas ejector when the make up water temperature below 15C°.



### Performance curve of Liquid Ring Vacuum Pump & Gas Ejector

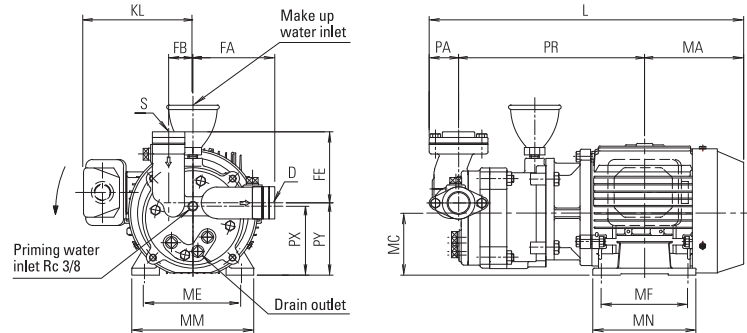


# Outline drawing

## LVFD/LVSD (Close-coupled type)



(LVSD is stainless steel version of LVFD)



Area	Model	Shaft power	S	D	PA	PR	PY	PX	FA	FB	FE	L	MA	MC	ME	MF	MM	MN	KL	Weight (kg)
50Hz	50LVFD5-55	5.5kW · 4P	50A	50A	67	429	252	207	214	60	199	707	210	197	310	260	346	410	240	128
	40LVFD5-37	3.7kW · 2P	40A	40A	61	360	137	122	158	44	148	607	186	112	190	140	220	168	164	65
	32LVFD5-22	2.2kW · 2P	32A	32A	47	273	110	105	135	42	135	463	143	95	140	125	176	150	156	33
	25LVFD5-15	1.5kW · 2P	25A	25A	43	269	105	100	118.5	35	118.5	454	143	90	140	125	176	150	159	32
	20LVFD5-07	0.75kW · 2P	20A	20A	39	222	98	87	106	30	106	409	148	80	125	100	165	130	159	22
	20LVD5-04	0.4kW · 2P	20A	20A	39	197	89	78	106	30	106	357	121	71	112	90	140	110	107	15
60Hz	50LVFD6-55	5.5kW · 4P	50A	50A	67	411	252	207	214	60	199	689	210	197	310	260	346	410	240	125
	40LVFD6-37	3.7kW · 2P	40A	40A	61	331	137	122	158	44	148	578	186	112	190	140	220	168	164	57
	32LVFD6-22	2.2kW · 2P	32A	32A	47	261	110	105	135	42	135	451	143	95	140	125	176	150	156	31
	25LVFD6-15	1.5kW · 2P	25A	25A	43	259	105	100	118.5	35	118.5	444	143	90	140	125	176	150	159	30
	20LVFD6-07	0.75kW · 2P	20A	20A	39	214	98	87	106	30	106	401	148	80	125	100	165	130	159	21
	20LVD6-04	0.4kW · 2P	20A	20A	39	193	89	78	106	30	106	353	121	71	112	90	140	110	107	15

\*40LVFD5(6)-37 has the make up water inlet of Rc 1/2.

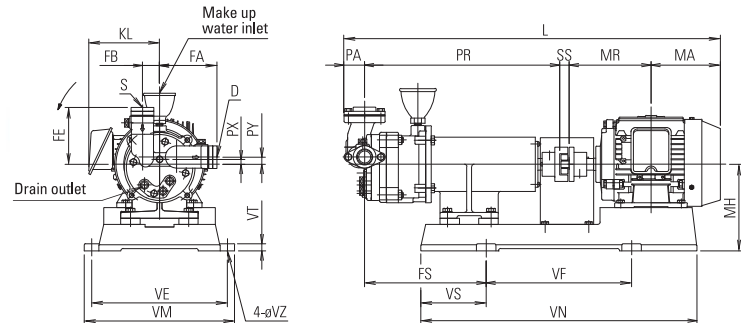
\*50LVFD5(6)-55 has the make up water inlet of Rc 3/4.

\*40LVFD5(6)-37 & 50LVFD5(6)-55 are mounted with JIS 5K FF flange

## LVF/LVS (Compact size base-mounted type)



(LVS is stainless steel version of LVF)



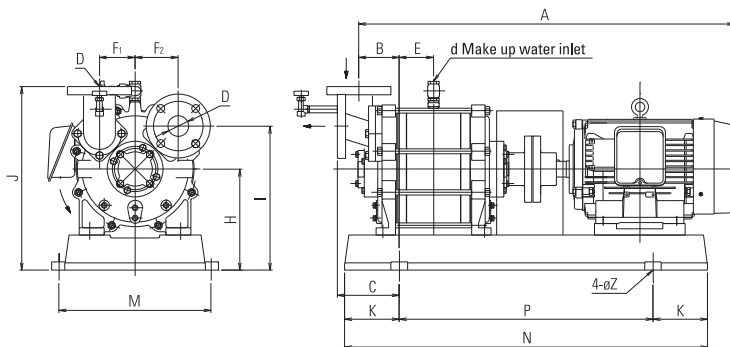
Area	Model	kW	S	D	PA	PR	PX	PY	FA	FB	FE	FS	MH	L	MA	MR	SS	VE	VF	VM	VN	VS	VT	VZ	KL	Weight (kg)
50Hz	20LVF-1	0.75	20A	20A	39	263.5	7	18	106	30	106	162	140	589.5	133	140	14	199	269	225	385	58	20	12	146	35
	20LVF-2	1.5	20A	20A	39	322	7	18	106	30	106	173	145	692	143	168	20	230	350	260	500	75	15	12	146	37
	25LVF	1.5	25A	25A	43	403	10	15	118.5	35	118.5	251	180	777	143	168	20	280	300	310	570	135	15	12	146	46
	32LVF	3.7	32A	32A	47	407	10	15	135	42	135	219	177	860	186	200	20	280	425	310	610	93	25	12	153	60
	40LVF	5.5	40A	40A	61	475	10	25	158	44	148	266	207	998	211	228	24	340	500	374	733	115	20	12	188	125
	50LVF	5.5	50A	50A	67	511	10	55	214	60	199	165	245	1052	211	139	24	368	614	404	878	132	20	15	188	161
60Hz	20LVF-1	0.75	20A	20A	39	259.5	7	18	106	30	106	158	140	585.5	133	140	14	199	269	225	385	58	20	12	146	35
	20LVF-2	1.5	20A	20A	39	314	7	18	106	30	106	165	145	685	143	168	20	230	350	260	500	75	15	12	146	36
	25LVF	1.5	25A	25A	43	393	10	15	118.5	35	118.5	241	180	767	143	168	20	280	300	310	570	135	15	12	146	45
	32LVF	3.7	32A	32A	47	395	10	15	135	42	135	206	177	848	186	200	20	280	425	310	610	93	25	12	153	59
	40LVF	5.5	40A	40A	61	446	10	25	158	44	148	237	207	969	211	228	24	340	500	374	733	115	20	12	188	124
	50LVF	5.5	50A	50A	67	493	10	55	214	60	199	147	245	1034	211	239	24	368	614	404	878	132	20	15	188	158

\*Above dimensions are based on TEFC motors Other motor types are available but dimension will be different.

\*LVF and LVS are base-mounted type and have identical performance as LVFD and LVSD.

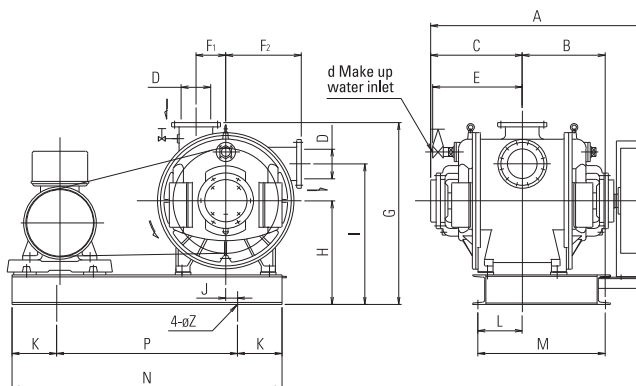
# Outline drawing

## SKH400-800 (Medium size base-mounted type)



Area	Model	Rotating speed (min <sup>-1</sup> )	D	A	B	C	E	F <sub>1</sub>	F <sub>2</sub>	H	I	J	K	P	N	M	Z	d	Shaft power (kW × P)	Weight (kg)
50Hz	SKH882	970D	150A	1804	335	355	100	166	193	510	703	880	250	1100	1600	610	23	1½ <sup>B</sup>	45 × 6	1200
	SKH882	735D	150A	1806	335	355	100	166	193	510	703	880	250	1100	1600	610	23	1½ <sup>B</sup>	30 × 8	1200
	SKH782	970D	125A	1474	271	295	70	138	163	410	573	725	200	930	1330	460	19	1 <sup>B</sup>	22 × 6	640
	SKH762	970D	100A	1400	238	275	65	138	149	410	559	725	180	900	1260	460	19	1 <sup>B</sup>	18.5 × 6	590
	SKH742	970D	100A	1298	239	276	37	138	149	410	559	725	180	800	1160	460	19	1 <sup>B</sup>	15 × 6	540
	SKH562	1450D	80A	1157	213	254	39	96	117	290	407	520	170	650	990	440	19	¾ <sup>B</sup>	11 × 4	300
	SKH542	1450D	65A	953	164	211	38	96	116	275	391	505	132	614	878	368	15	¾ <sup>B</sup>	7.5 × 4	240
	SKH462	1450D	65A	924	153	200	60	86	111	245	356	445	132	614	878	368	15	¾ <sup>B</sup>	5.5 × 4	210
60Hz	SKH882	870D	150A	1925	385	405	50	166	193	510	703	880	300	1100	1700	610	23	1½ <sup>B</sup>	37 × 8	1350
	SKH782	1160D	125A	1577	271	296	70	138	163	410	573	725	200	960	1360	460	19	1 <sup>B</sup>	30 × 6	720
	SKH682	1160D	100A	1414	261	300	53	122	142	350	492	625	200	860	1260	390	19	1 <sup>B</sup>	18.5 × 6	520
	SKH662	1160D	100A	1301	241	280	43	122	142	350	492	625	180	790	1150	390	19	1 <sup>B</sup>	15 × 6	460
	SKH562	1750D	80A	1201	205	246	47	96	117	300	417	530	160	740	1060	320	19	¾ <sup>B</sup>	15 × 4	320
	SKH642	1160D	80A	1198	207	256	29	122	133	350	483	625	160	710	1030	390	19	1 <sup>B</sup>	11 × 6	410
	SKH542	1750D	65A	1067	200	247	2	96	116	290	406	520	170	650	990	440	19	¾ <sup>B</sup>	11 × 4	280
	SKH462	1750D	65A	962	163	210	50	86	111	245	356	445	132	614	878	368	15	¾ <sup>B</sup>	7.5 × 4	220
	SKH442	1750D	50A	865	147	199	34	86	104	235	339	435	115	500	730	340	12	¾ <sup>B</sup>	5.5 × 4	195
	SKH422	1750D	50A	744	147	200	7	86	104	232	336	432	121	448	690	324	12	¾ <sup>B</sup>	3.7 × 4	155

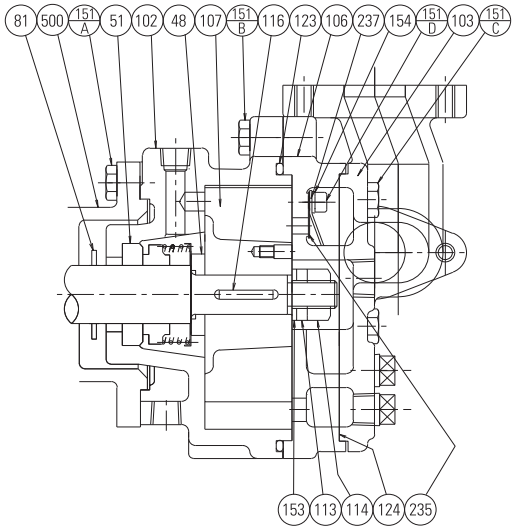
## LV102/202 (Large size belt driven type)



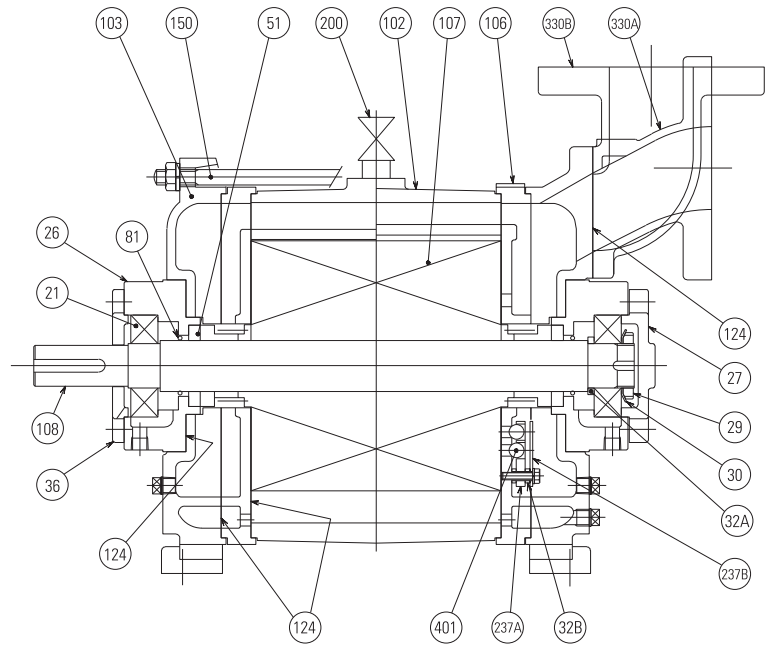
Model	Rotating speed (min <sup>-1</sup> )	D	A	C	E	F <sub>1</sub>	F <sub>2</sub>	G	H	I	J	K	L	P	N	M	d	Z	Shaft power (kW × P)	Weight (kg)
LV202	675	200	1468	618	611	200	510	1308	778	1028	215	320	310	1500	2140	870	2 <sup>B</sup>	26	110 × 4	2800
	195										340	1360		2040	90 × 4				2750	
	75 × 4										2650									
LV102	880	150	1255	525	545	160	430	1050	600	810	115	280	255	250	1140	700	2 <sup>B</sup>	24	75 × 4	1700
	125										270	245		1100	1660				55 × 4	1500
	45 × 4										1400									

# Cross section drawing & Parts material table

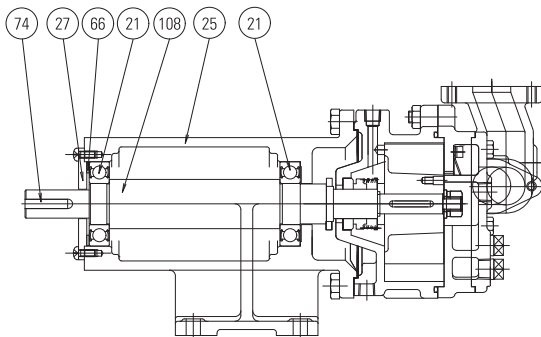
**LVFD/LVSD**



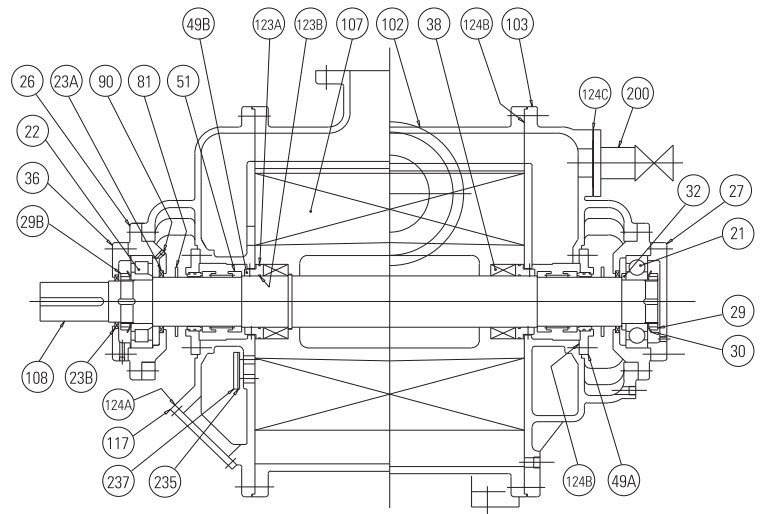
**SKH400-800**



**LVF/LVS**



**LV102/202**



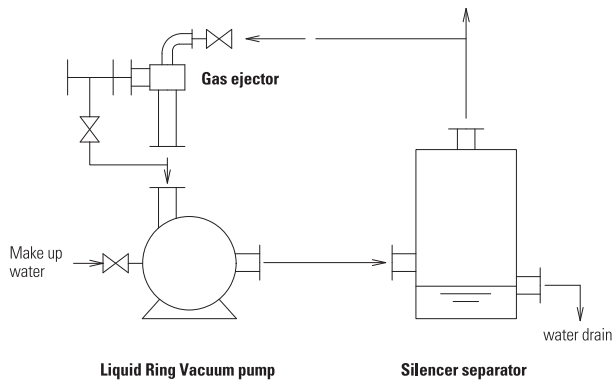
## Parts material table

Parts No.	Parts Name	LVFD & LVSD		LVF & LVS		SKH400 - 800			LV102 -202		
						Comb. A	Comb. B	Comb. C	Comb. A	Comb. B	Comb. C
21	Ball bearing	-	-	SUJ		SUJ			SUJ		
22	Roller bearing	-	-	-	-	-	-	-	SUJ		
23 A,B	Oil seal	-	-	-	-	-	-	-	NBR		
25	Bracket	-	-	FC200		-	-	-	-	-	-
26	Bearing case (End side)	-	-	-	-	FC200	SCS13	SCS14	FC200		
27	Bearing cover (End side)	-	-	FC200		FC200	SCS13	SCS13	FC200		
29	Bearing nut	-	-	-	-	S35C			S30C		
30	Bearing washer	-	-	-	-	SS400			SS400		
32 (A)	Bearing collar	-	-	-	-	SUS403			SUS403		
32 (B)	Ring	-	-	-	-	SUS304		SUS316	-	-	-
35	Bearing cover (Opp. side)	-	-	-	-	FC200	-	-	-	-	-
36	Bearing cover (End side)	-	-	-	-	FC200	SCS13		FC200		
38	Impeller stopper	-	-	-	-	-	-	-	SUP		
48	Mechanical seal retainer	SUS304		SUS304		-	-	-	-	-	-
49A	Seal cover	-	-	-	-	-	-	-	FC200	SCS13	SCS14
49B	Lock cover	-	-	-	-	-	-	-	FC200	SCS13	SCS14
51 (A,B)	Mechanical seal	Ceramic × Carbon*1		Ceramic × Carbon*1		Ceramic × Carbon			Ceramic × Carbon		
66	Wave washer	-	-	SK		-	-	-	-	-	-
74	Key	-	-	S45C		-	-	-	-	-	-
81	Slinger	NBR	FKM	NBR	FKM	NBR			NBR		
90	Grease nipple	-	-	-	-	-	-	-	SS, SGP		
102	Casing	FC200	SCS13	FC200	SCS13	FC200	SCS13	SCS14	FC200	SCS13	SCS14
103	Cover	FC200	SCS13	FC200	SCS13	FC200	SCS13	SCS14	FC200	SCS13	SCS14
106	Guide / Control plate	SCS13		SCS13		FC200	SCS13	SCS14			
107	Impeller	SCS13		SCS13		FCD450	SCS13	SCS14	FCD450	SCS13	SCS14
108	Shaft			SUS304		SUS403	SUS304	SUS316	SUS403	SUS304	SUS316
113	Impeller washer	SUS304		SUS304		-	-	-	-	-	-
114	Impeller nut	SUS304		SUS304		-	-	-	-	-	-
116	Impeller key	SUS304		SUS316		-	-	-	-	-	-
117	Inspection cover					-	-	-	SS400	SUS304	SUS316
123 (A, B)	O-ring	NBR	FKM	NBR	FKM	-	-	-	NBR	FKM	
124	Liquid gasket	Three bond #1184		Three bond #1184		Three bond #1184			-	-	-
124A	Gasket	-	-	-	-	-	-	-	NBR	FKM	
124B	Liquid packing	-	-	-	-	-	-	-	Three bond #1215		
124C	Gasket	-	-	-	-	-	-	-	Non-asbestos		
150	Tie bolt	-	-	-	-	SNB7			-	-	-
151 (A,B,C)	Bolt	SUS304		SUS304		-	-	-	-	-	-
153	Plain washer	SUS304		SUS304		-	-	-	-	-	-
154	Spring washer	SUS304		SUS304		-	-	-	-	-	-
200	Maintenance water inlet	-	-	-	-	CAC,SGP	SUS304	SUS316	CAC,SGP	SUS304	SUS316
235	Valve plate	PTFE		PTFE					PTFE		
237 (A,B)	Valve plate (Ball) retainer	SUS304		SUS304		SUS304	SUS304	SCS14	SUS304		SUS316
401	Ball	-	-	-	-	PTFE				-	-
500	Motor	Shaft: SUS316L		-	-	-	-	-	-	-	-

\*1 Mechanical seal for 40LVSD, 50LVF/SD is SiC - Carbon

# By installing the gas ejector, performance stabilizes at the high vacuum range

## Liquid Ring Vacuum pump with the gas ejector

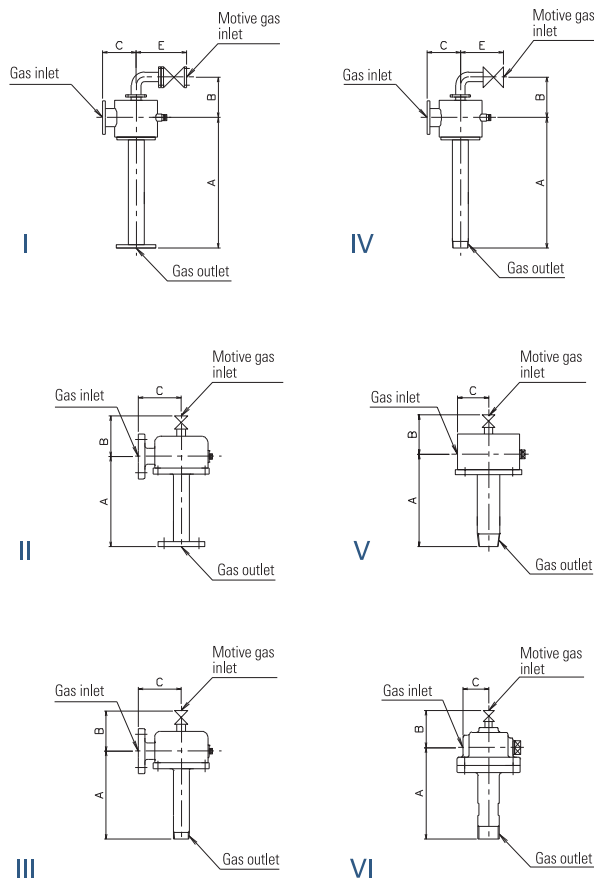


- When the water is used for the operating liquid, cavitation occurs around 8kPa(abs) if the water temperature reaches at 30°C. However, by installing the gas ejector at the suction of the liquid ring vacuum pump, it will operable around 1.3~2kPa(abs). In this case, the operating pressure of the liquid ring vacuum pump achievable around 13kPa (abs) and cavitation does not occur. The gas ejector uses the air of the atmospheric pressure (or the exhaust gas from the vacuum pump) as the motive source. Therefore, there is no need for the separate power source.

- In the case where the molecular weight of the drawing gas is higher than air, the suction condition sucking volume will decrease. Therefore, please consult with us.

- When higher vacuum than the performance shown in Page 6-9, it is possible to install two gas ejectors in parallel. Furthermore, when vacuum level of 0.05kPa(abs) is required, it is possible by using the mechanical booster pump in parallel. Please also consult with us for this case.

## Ejector outline dimension



## Gas Ejector dimension table

Model	D <sub>1</sub>	D <sub>2</sub>	d	A	B	C	E	Fig.
150BE8H	150A	200A	80A	1350	313	200	377	I
150BE6H	150A	200A	80A	1280	313	200	377	
150BE4H	150A	200A	80A	1280	313	200	377	
125BE8H	125A	150A	65A	1050	288	200	367	
125BE6H	125A	150A	65A	1050	288	200	367	
125BE4H	125A	150A	50A	910	288	200	357	
100BE8H	100A	150A	50A	930	253	190	332	
100BE6H	100A	150A	50A	810	253	190	332	
100BE5H	100A	150A	50A	810	253	190	332	
125NE30	100A	125A	Rc2	817	254	210	-	
125NE22	80A	125A	R11/2	722	209	200	-	
100NE18	65A	100A	R11/2	670	203	180	-	
100NE15	65A	100A	R11/2	598	183	153	-	
80NE15	50A	80A	Rc 1	504	161	153	-	
80NE11	50A	80A	Rc 1	504	161	153	-	
65NE11	50A	65A	Rc 1	504	161	150	-	
65NE75	40A	65A	Rc3/4	404	133	130	-	
65NE55	32A	65A	Rc3/4	345	133	130	-	
50NE55	32A	50A	Rc3/4	343	133	130	-	
40NE37	32A	R11/2	Rc3/4	263	133	130	-	III
32BE6L	32A	50A	20A	262	168	130	222	I
25BE6L	25A	R11/4	Rc3/4	172	163	120	150	
25BE4L	25A	R11/4	Rc3/4	172	163	120	150	IV
32NE22	Rc 1	R11/4	Rc1/2	173	110	60	-	V
25NE15	Rc 1	R1	Rc1/2	173	110	60	-	
20NE070	Rc 1/2	R3/4	Rc1/4	112	79	32	-	VI
20NE04	Rc 1/2	R3/4	Rc1/4	102	79	32	-	

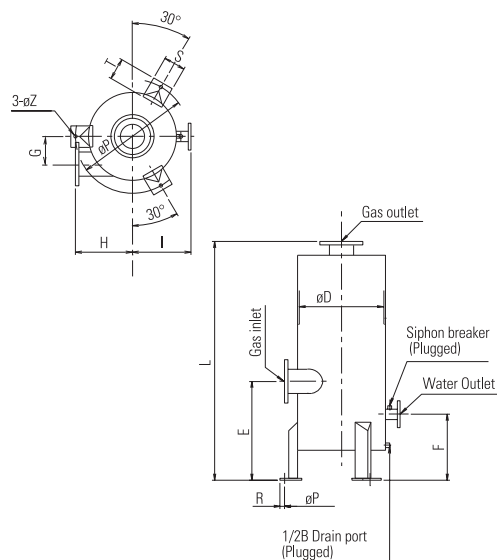
\*Flange standard: JIS 10K FF

Threaded connection for the indications in inch for D1, D2 & d dimensions

\*Dimension and shape for stainless steel material will be different.

# Silencer separator

## CT outline dimension (For SKH model and LV102, 202 model)



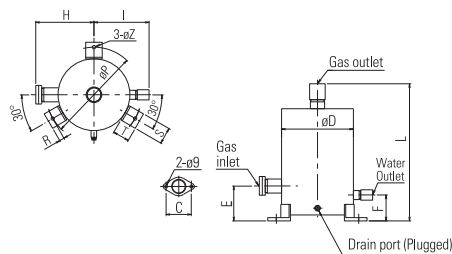
CT type silencer separator consists of the lower part separator and the upper part silencer. When the water is drained from the separator, the flow could be intermittent due to the siphon phenomena. Although this will not have adverse effect on the pump performance, please remove the plug of the siphon breaker.

The piping connection between the pump outlet and the separator inlet shall be flat or sloped downward from the pump to the separator. Please ensure that the length of the connection piping shall be as short as possible.

Model	A	B	D	L	E	F	G	H	I	P	R	S	T	Z	Weight (kg)
CT202	200A	80A	800	2238	1028	728	250	480	500	1010	30	150	150	23	390
CT153	150A	80A	800	2020	810	510	250	480	500	1010	30	150	150	23	370
CT152	150A	65A	650	1723	703	463	210	400	420	820	25	125	125	19	210
CT125	125A	50A	500	1383	573	383	160	330	340	660	25	125	125	19	135
CT100	100A	50A	400	1232	492	312	130	270	290	520	18	75	80	15	90
CT80	80A	50A	400	1147	407	227	130	270	290	520	18	75	80	15	90
CT65	65A	40A	300	1046	356	206	100	210	230	420	18	75	80	15	50
CT50	50A	40A	300	1026	336	186	100	210	230	420	18	75	80	15	50
CT40	40A	25A	200	730	250	150	160	160	180	310	18	75	80	15	25
CT32	32A	25A	200	730	250	150	160	160	180	310	18	75	80	15	25

- Note 1) Flange standard: JIS 10K 2) Standard material : SGP SS400  
 3) The connection height (E dimension) is provided to be the lowest height of discharge point among the applicable pumps for CT50-CT100.  
 The connection height (E dimension) is matched to the discharge point of applicable pumps for CT125-202.  
 4) CT152 is for SKH882 and CT153 is for LV102 respectively.  
 5) Special dimensions and materials are available upon request.

## CN outline dimension (For LVFD & LVSD)



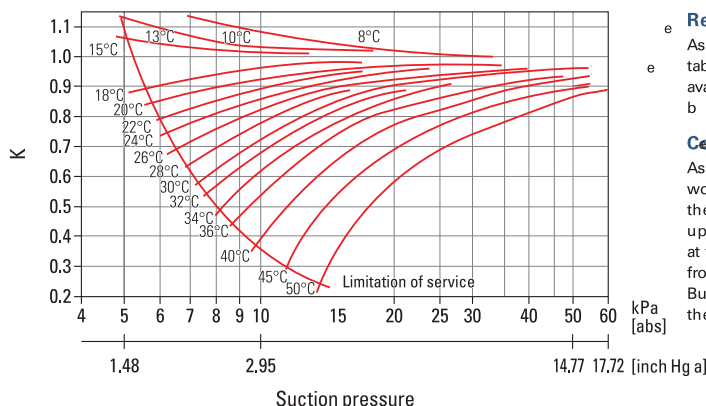
Model	A1	A2	B	C	D	E	F	H	I*	P	R	S	T	Z	d	L
50CN	50A	50A	32A	-	267	256	145	190	210	330	18.7	50	50	15	15A	600*
40CN	40A	40A	20A	-	216	147	62	175	165	285	15	50	50	10	8A	392*
32CN	32A	32A	20A	76	216	110	78	175*	165	285	15	50	50	10	8A	413*
25CN	25A	32A	20A	67	216	105	78	258*	165	285	15	50	50	10	8A	413*
20CN-2	20A	32A	20A	60	216	98	71	247*	165	285	15	50	50	10	8A	406*
20CN-1	20A	32A	20A	60	216	89	62	247*	165	285	15	50	50	10	8A	397*

- Note 1) Dimension may be slightly different due to threaded connection.  
 2) Gas inlet and gas outlet of 40CN and 50CN are JIS 5K FF flange.  
 3) G dimension is the radial-wise eccentric distance between the separator main unit center and the gas inlet A1.

# Make up water

Make up water is not only performs as pistons for air compressions in the pump, but also works for cooling the pump and shaft seals portion or sealing of leakage. Therefore it should be supplied constantly during operation.

## Compensating rate due to the change of make up water temperature



**Required pressure**  
 As standard practice, make up water should be fed with pressure. As shown in performance table in page 6 & 8, 0.05 to 0.15 MPa pressure is required. If pressure supply is not available, vacuum pumps can be modified to self-priming structure, but performance will be dropped a little bit in this case.

**Compensating rate of suction performance with make up water temperature**  
 As Liquid Ring Vacuum pump uses water to perform air compression, suction efficiency would be changed in case if sucking dry air because of the influence by water vapor due to the changes of water temperature. For example, sucking pressure at 20 kPa with the make up water in 30°C, multiply the value indicated in the standard performance curve acquired at the water temperature of 15°C by the compensating rate  $K=0.9$  which can be acquired from the chart on the left.  
 But this phenomenon would not be occurred in case of sucking in wet air. The changes of the suction performance is negligible, and performance can be referred to standard 15°C

## Our Company

Established in 1946, Nikuni has been engaged in designing and manufacturing various industrial pumps and pump installations, semi-conductor production systems, semi-conductor test devices and optical devices.

For more than seventy years, Nikuni has been serving the Japanese, USA, European and Asian industries with high-quality products.

## Our Product Line

Nikuni's major pump business consists of Regenerative Turbine Pumps, Centrifugal Pumps, Liquid-Ring Vacuum Pumps, Wet Type Shredder Pumps and Self-priming Liquid-Gas Transfer Pumps. Nikuni has also developed pump-related systems as well as Hydro Cyclone Separator (VDF) and Coolant Filtration Systems (NAX Series) which are used in many countries all over the world.



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